Please cancel claim 9 without prejudice.

B2

10. (Amended) A method as claimed in Claim 1 wherein silver orthophosphate is added during manufacture of the glass as a source of silver ions.

Please cancel claims 16 through 20 without prejudice.

REMARKS

Claim 1 has been amended and now relates to a method of producing water-soluble silver ion releasing glass fibers. There is basis for this amendment at page 9, lines 8 to 11 of the specification as filed. Further to the Examiner's observations, the wording of Claim 1 has now been clarified to specifically relate to the step of maintaining the temperature of a portion of the molten glass at the working temperature. This step is disclosed in all of the examples, specifically at page 10, line 29 and at page 11, line 14 of the specification as filed.

The method of manufacturing water-soluble, silver ion releasing glass fibers comprises:

- heating a composition suitable for producing such fibers to form a molten glass;
- cooling a portion of the molten glass to a working temperature;
- maintaining the temperature of said portion at the working temperature; and
- processing the molten glass into fibers.

None of the prior art documents cited disclose a method of manufacturing silver ion releasing, water-soluble glass fibers.

Gilchrist discloses a water-soluble glass able which

releases silver ions. Only conventional methods of manufacture are disclosed (column 4, lines 42 to 49 of Gilchrist '585).

Conventional methods of forming water-insoluble glass fibers are not successful when used to process water-soluble glass formulations. No examples in the Gilchrist reference disclose formation of glass fibers. Hence Gilchrist does not disclose or suggest suitable methodology for the formulation of a water-soluble silver ion-releasing glass fiber.

The Examiner asserts that it would have been obvious to one skilled in the art at the time of the invention to manufacture the glass of Gilchrist using the methods disclosed in either Tooley or Loewenstein. Applicant disputes this.

Tooley does not relate to manufacture of water-soluble glass fibers, but to manufacture of **non-soluble**, bulky, **silicon dioxide-based** glass objects like bottles (see page 374). As such Tooley relates to an altogether different technology--manufacture of insoluble silicon dioxide-based glass (see Tooley's examples on pages 243, for which Tooley's results are set forth in his Figures IX-B-2 and IX-B-3)--than the invention as presently claimed. One ordinarily skilled in the art of manufacture of phosphorus pentoxide-based soluble glass would have had no motivation to find, much less combine the teachings of, a document primarily disclosing a method of manufacturing silicon dioxide-based water-insoluble glass bottles (Tooley) with the teachings of a document disclosing water-soluble glass containing and releasing silver ions (Gilchrist).

At the time of the invention it was understood that water-soluble glass fibers could not be formed by conventional glass making techniques. For instance, the fibers formed by the method of US 4,604,097 (referred to on

page 3, lines 5-10 of this application) have a very low tensile strength. The ordinarily skilled worker would have been prejudiced against using a method to manufacture non water-soluble silicon dioxide-based glass bottles to manufacture water-soluble phosphorus pentoxide-based glass fibers. There is no suggestion in any of the cited prior art documents that the method of Tooley would prove to have utility in this field with these materials.

The method described in Tooley involves the steps of heating the glass forming composition above its melting point, and then cooling it to a working temperature. The working temperature is defined in terms of the viscosity of the glass.

In further response to the Examiner's comments, the present invention clearly discloses the step of maintaining the molten glass at the working temperature. The method of Tooley involves cooling the molten glass to a working temperature where the working temperature is cool enough to allow the glass articles to be formed, presumably by glass blowing or casting. Tooley neither discloses nor suggests maintaining the glass at the working temperature before processing. Neither does Tooley disclose processing the molten glass at the working temperature into fibers.

Tooley does not relate to water soluble glass, nor does Tooley relate to silver ion-releasing glass. Tooley relates to **silicon dioxide**-based **insoluble** glass. It would not have been obvious to one ordinarily skilled in the art to combine Gilchrist with Tooley and there was no suggestion or motivation to do so. Furthermore Applicant submits that the combination of Tooley and Gilchrist would not lead one ordinarily skilled in the art to the present invention since the step of maintaining the molten glass at the working temperature and the step of processing the molten glass into fibers are not disclosed or suggested.

Loewenstein relates to glass compositions and methods of **continuous** glass fiber manufacture. Loewenstein discloses a method of manufacturing long lengths of water-insoluble glass fibers typically for electrical applications. As such, Loewenstein is no more relevant to the patentability of this invention than the prior art noted in applicant's specification, namely conventional pulling techniques as mentioned on page 2, line 14 of the application.

Moreover, Loewenstein, being concerned with production of long, continuous fibers for electrical and optical applications, where fiber length is paramount, is not concerned and would not be of interest to one of ordinary skill in the art to which this invention pertains--the creation of water-soluble short fibers of phosphorus pentoxide-based glass, suitable for biological, as contrasted to electrical, applications. For biological applications, unlike in electrical applications, fiber length is not a consideration. In biological applications, to which the fibers of the invention are directed and will be used, long length is not a requirement and in many cases would do nothing but require another step in the manufacturing procedure—that being the step of cutting the fibers to a shorter length so that they could be implanted or combined with a carrier for implantation, etc. Hence, a worker in the biological field, being unconcerned with longer fibers and in fact trying to produce relatively short fibers, would shy away from even consulting a work such as Loewenstein's which is concerned with manufacture of such "**continuous**" fibers.

It would not have been obvious to one skilled in the art at the time of the invention to combine the teachings of Loewenstein with those of Gilchrist. As described above, at the time of the invention it was understood that water-soluble glass fibers, such as the phosphorous pentoxide-

based soluble glasses of the preferred embodiment of this invention, do not lend themselves to conventional silicon dioxide-based water-insoluble glass-making methods, which have a very different chemistry. As such, the ordinarily skilled worker in the biological research field specializing in water soluble glasses would have been prejudiced against combining these two documents.

The method disclosed in Loewenstein involves the step of heating a composition suitable for producing a water-insoluble glass above its melting point. Loewenstein teaches that the temperature of the glass should stay constant or fall slightly (see page 103, lines 2 and 3). The temperature of the glass composition is reduced slightly while in the furnace to ensure that all of the glass is heated thoroughly (see Fig. IV/29). This is part of the heating stage. There is no suggestion that cooling and maintaining the molten glass at a lower temperature allows better quality glass fibers to be obtained.

Loewenstein does not disclose or suggest the step of maintaining a portion of the molten glass at the working temperature. As the Examiner indicated, this is an important step in the method of the present invention. Also, Loewenstein makes no mention of water-soluble silver ion-releasing glass fibers.

Applicant respectfully asserts that Claim 1 as amended is allowable, and that the Examiner's objections have been overcome.

The Examiner also raised objections to dependent claims 2 to 20, of which claims 16 through 20 have been canceled, without prejudice. Applicant asserts that since amended claim 1 is novel and inventive, dependent claims 2 to 15 are allowable.

Applicant believes that the present amended Application is in a condition for allowance and issuance of a patent is earnestly solicited.

To the extent any fee may be required in connection herewith, please charge the same to deposit account 50-1943.

Respectfully submitted,

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I hereby certify that this paper, along with any paper referred to as being attached or enclosed, is being deposited with the United States Postal Service on the date indicated below, with sufficient postage, as first class mail, in an envelope addressed to: Commissioner for Patents, Washington, DC 20231

BY: Charles Quinn

DATE: 29 August 2001